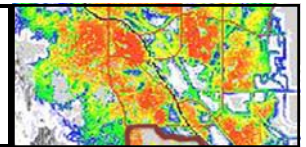


Sustainability, Encroachment, and Room to Maneuver Newsletter



ERDC-CERL

July '05

Mission Sustainability: A Juggling Act Between Installations and Surrounding Communities

If you think juggling a bowling ball, an egg, and a live chicken is difficult, try juggling the various training needs of an installation with the needs and desires of its surrounding communities.

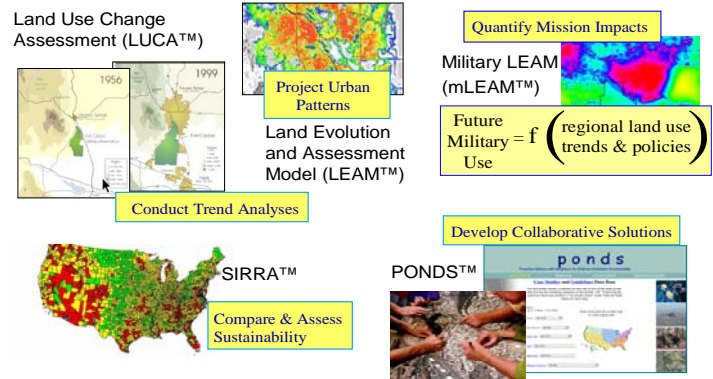
SERM is the Army Corps of Engineers' Sustainability, Encroachment, and Room to Maneuver program. Numerous external pressures affect the ability of the military services to maintain force readiness. Some of these pressures result from land-use changes on and near installations. Finding adequate training and testing areas is challenging because weapons fire farther, vehicles travel faster, the number of installations and ranges is decreasing, and ever-increasing environmental laws are excluding more on-post resources. Military installations generate noise, dust, and smoke that may disturb nearby neighbors. Conversely, neighbors may install bright lights that interfere with night training activities and radio transmitters that interfere with soldier communications.

The term "encroachment" is often used as a general descriptor for the many issues that constrain the military use of land, air, and sea space. The combination of encroachment impacts and increased space demands for training and testing complicate service and installation planning requirements. Therefore, installa-

tion managers and others need tools to: 1) identify and monitor land-use changes, 2) predict risks to military training and testing, and 3) attempt to mitigate these risks. These tools are under development through research conducted by the US Army Engineer Research and Development Center—Construction Engineering Research Laboratory (ERDC-CERL).

The following news features highlight some of the various real-world application tools that can be used to address these issues.

Sustainability, Encroachment and Room to Maneuver (SERM)



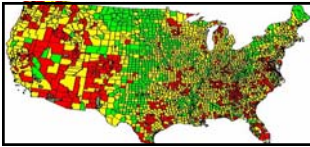
Relationships Between the Components of SERM

		<u>Target</u>	<u>Time</u>	<u>Space</u>
<u>SERM Components:</u>				
	SIRRA	OSD/HQDA/ACSIM/IMA	Now	County Resolution/ Watershed
	LUCA	Installations/IMA/OSD	Past 50 years	1 km
	LEAM	Installations/IMA/OEA	Future 50 years	30 m
	PONDSTM	Installations/Regional IMA	Now	Regional

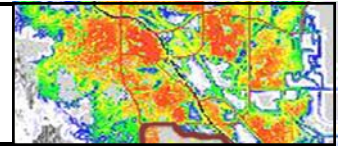
Key:

OSD: Office of the Secretary of Defense ACSIM: Assistant Chief of Staff for Installation Management
HQDA: Headquarters, Department of the Army IMA: Installation Management Agency OEA: Office of Economic Adjustment

The new SERM website is up and running! Check it out at <https://eko.usace.army.mil/fa/serm/>



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Can Your Region Continue to Support Your Installation's Training Requirements?

Fort Stewart, Georgia, is the largest Army installation east of the Mississippi River. Expanding over parts of six counties, Fort Stewart covers approximately 280,000 acres of land. Various types of training, ranging from helicopter gunnery to field artillery, are conducted at the installation. Supplied with good weather that rarely halts training, at first glance, it appears Fort Stewart is an ideal location for additional troops. However, even though the weather may be conducive to training, it does not mean that region has the ability to maintain environmental and mission sustainability.

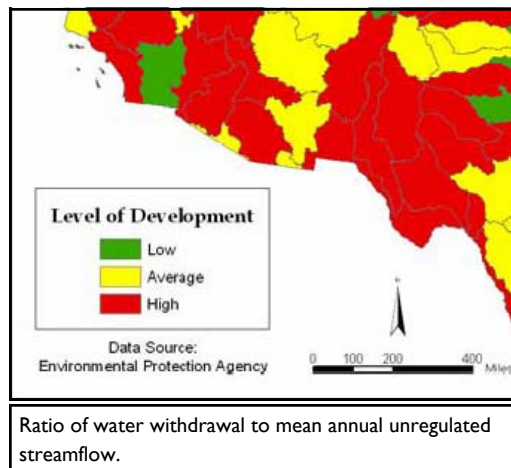
Question: How can the Army determine whether or not to house more troops at the installation?

Answer: By conducting a Sustainable Installations Regional Resource Assessment (SIRRA) analysis. This analysis was performed on the region around Fort Stewart to rate sustainability issues with respect to increasing troop strength at the installation.

SIRRA is a web-based analysis tool that uses 45 indicators to address nine sustainability issues including air, energy, urban, threatened and endangered species, locational, water, economic, quality of life, and infrastructure. Analysis results for each indicator are color-coded in red, yellow, or green to easily show which indicators should be further examined or taken into consideration when making a decision.

This regional level screening tool has proven both successful and useful for installations. SIRRA was not only used for stationing troops at Fort Stewart,

but also for siting a bombing range at Rattlesnake Training Grounds, Montana. Three counties were considered for the new Rattlesnake Training Grounds. By using SIRRA, a comparison could easily be made between the counties through evaluation of sustainability issues.



Through the use of national sources, such as the US Geological Survey, Bureau of Census, NatureServe, and the US Environmental Protection Agency, SIRRA provides a large source of information in an online database. This site also contains data from two SIRRA analyses of watersheds and over 300 installations.

When asked about one of the most important aspects of SIRRA, Urban Planner Natalie Myers, a contractor at ERDC-CERL, said, "SIRRA is a screening tool with data at the regional level and is not

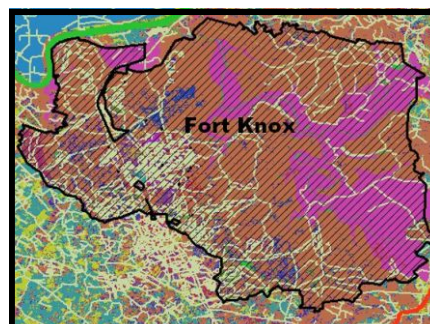
installation-specific. It provides data for an evaluation of key issues in a region around an installation so further examination can be done on specific problems."

Currently, SIRRA supports the National Environmental Policy Act (NEPA) analyses. The intent of using SIRRA to aid in a NEPA analysis is to provide guidance for Commanders and US Army Reserve Support Commands.

For more information about SIRRA, visit <https://eko.usace.army.mil/fa/serm/> and click on "Regional Sustainability Indicators."

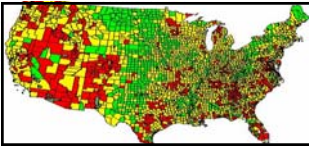
Analysis of Historic Growth Patterns Around Fort Knox Helps Light the Way Forward

Fort Knox, Kentucky, like many other military installations, is experiencing land-use changes around its installation that could affect its ability to accomplish its mission. In an effort to be proactive, Fort Knox is engaging the expertise at ERDC-CERL to conduct an analysis of the historic growth patterns around Fort Knox from the 1970's to the present. The Land Use Change Assessment (LUCA™) procedures developed by ERDC-CERL enable visualization of past urban development.

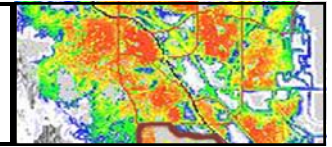


Land-use data was obtained from numerous sources, including various maps, satellite imagery, and land cover data produced by the US Geological Survey.

Bruce MacAllister, Ecologist at ERDC-CERL, stated "Fort Knox not only wanted an analysis of past historic growth patterns, but also wanted ERDC-CERL to estimate the projected growth rate up to the year 2020. The historic data has also been entered into the Land-use Evolution and impact Assessment Model (LEAM) to determine if the



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results differ significantly from the straight-line projection.” In addition, another source of data, based on night lights, has been obtained from satellite imagery as an estimation of growth around Fort Knox.

The product of this effort will be a three-fold report, including: 1) data analyses from the straight-line estimation and LEAM results, 2) a copy of all maps and GIS data obtained and generated during the project, and 3) a list of recommendations suggesting where Fort Knox can most effectively use their financial resources. According to Bruce MacAllister, “These recommendations are the most important piece of the puzzle, for they may suggest purchasing various parcels of land or entering into

cooperative land agreements with property owners of the surrounding community—without actually purchasing the land.” Either case would result in a buffer zone between the installation and surrounding community, thereby enabling the peaceful coexistence of both. Bruce MacAllister commented, “In these uncertain financial times, it is critical that the military use their limited financial resources effectively to sustain their mission.”

For more information about LUCA, visit <https://eko.usace.army.mil/fa/serm/> and click on “Historic Growth.”

How to Space and Time Travel Without Ever Leaving Your Desk

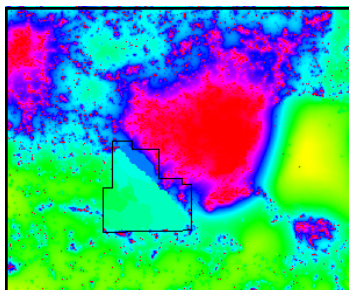
Have you ever wondered what the future holds, but your crystal ball wasn't up to the task? Researchers at the University of Illinois at Urbana-Champaign (UIUC) and ERDC-CERL have developed a suite of software tools and application processes that peer into the future. These tools help predict how current and proposed state, county, and local planning will affect the dynamic and spatial interactions between the military community's mission and land-use needs, and the adjacent community's goals, planning policies, and probably spatial growth patterns.

The Land-use Evolution and impact Assessment Model (LEAM) simulates land-use change across space and over time that enables planners, policymakers, interest groups, and ordinary citizens to visualize and examine the potential impact of various policy decisions. First, the researchers work with military and community planners and stakeholders to identify local factors that produce land-use change in their communities. Second, a model, tailored to address their specific concerns, is developed.

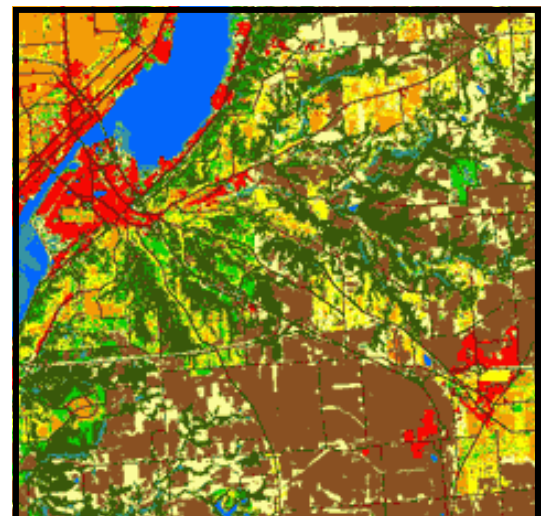
Third, data to populate the model is obtained from various sources including national data sets, state agencies, and water and soil conservation districts. If available, local planners may optionally supply locally-developed GIS data for more accurate simulations. Last, simulations are shown on color-coded maps so that the results can be readily understood and interpreted by all interested parties.

Brian Deal, research professor of Urban Planning at UIUC, stated, “The model allows decision makers to test scenarios to help them consider what their preferred outcome is and how they can get there.”

LEAM can be used for military and non-military applications. Fort Benning, Georgia used LEAM to model how urban growth around the installation might encroach on its ability to carry out its mission.

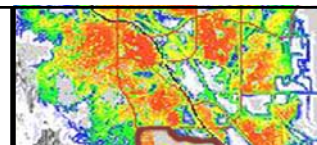


$$\text{Future Military Use} = f \left(\begin{array}{l} \text{regional land use} \\ \text{trends \& policies} \end{array} \right)$$





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The installation used LEAM results to determine the most appropriate site to locate a new training ground to minimize potential conflict with the neighboring community.

LEAM has also been used in non-military settings. Counties in northern Illinois are trying to cope with the rapid influx in population and the accompanying spatial demands from the expanding metropolitan Chicago area. Different simulations highlight the potential impacts on the counties' agricultural land and open spaces. In the St. Louis area, planners are working on a 10-county project (encompassing counties in Illinois and Missouri) to determine reasons for migration from the city center, what policies might affect this trend, and how various public spending initiatives can best influence growth.

For more information about LEAM, visit <https://eko.usace.army.mil/fa/serm> and click on "Land Use Evolution and Assessment."



How Others Have Solved Your Encroachment Problem

Have you ever wondered if someone else has faced a similar land-use problem, but you don't know where to look? Does the thought of "Google" searching make you woozy? If so, you're in luck. ERDC-CERL has developed a web capability to provide military and neighboring communities with a central information source to help resolve land-use conflicts, and thereby avoid constraints to the military mission. The Proactive Options for Neighbors for Defense-installation Sustainability (PONDS™) program has a website currently populated with approximately 300 records of various legislative actions, relevant national, regional, and local data sources, journal articles, reference guidelines, and case studies.

The website contains land-use mitigation strategies and guidelines comprised of topics



such as encroachment, water conservation, threatened and endangered species, and noise issues. The website is particularly useful for those dealing with specific problems encountered at the installation-level.

According to Suzanne Loechl, Landscape Architect at ERDC-CERL, "Collaborative regional planning can help identify solutions to ensure the long-term sustainability of installations and their neighboring communities."



James Westervelt, Community Planner at ERDC-CERL, added, "A proposed placement of a highway could encourage population growth that might hamper the installation's ability to carry out their mission and could, ultimately, impact the Base Realignment and Closure (BRAC) process."

The easy-to-use website requires no prior experience or passwords. A "Comment/Suggestion" button allows the user to contact the PONDS™ team with questions, comments, or suggestions for articles or case studies to include in the database. Annette Stumpf, Architect at ERDC-CERL, commented, "Once people find out about the existence of the PONDS™ website, they're very interested in using it. We'd like to get the word out about the website so that more and more people can benefit from the information it contains."

For more information about PONDS, visit <https://eko.usace.army.mil/fa/serm> and click on "Incompatible Land Use Solutions."

The new SERM website is up and running! Check it out at <https://eko.usace.army.mil/fa/serm/>